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ABSTRACT

The activities of the National Board on Graduate Education have been defined as: (1) the initiation of new research studies and the encouragement of experimentation and innovation; (2) the coordination and review of current research efforts and studies; (3) the dissemination of information and referrals for individuals, institutions, and agencies; (4) the preparation and circulation of a continuing annotated bibliography of literature on graduate education; and (5) the conduct of programs for the stimulation of public and professional discussion of the reports, findings, and recommendations of the Board. The present report sets forth the Board's view of the fundamental purposes of graduate education, discusses the problems and concerns currently facing graduate education, and indicates the role that the Board will perform in helping to resolve these issues. (Author/HS)

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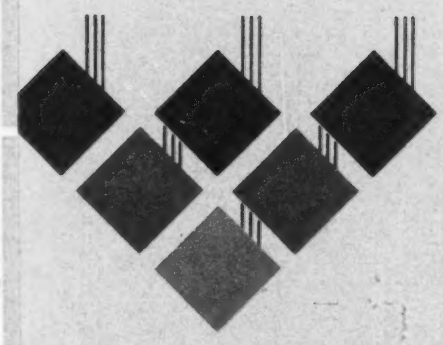

Graduate Education: Purposes, Problems, and Potential

A Report of the

NATIONAL BOARD ON

GRADUATE EDUCATION

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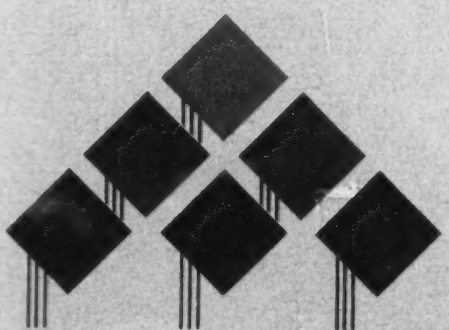

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NATIONAL BOARD ON

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FOREWORD

Following a decade of unprecedented growth, graduate education today is undergoing the difficult transition to a new environment of slower growth, changing student aspirations, reduced support, and demands for alternative curricula. The problems, questions, and opportunities associated with this process of change create the need for a critical review of the purposes and practices of graduate education. Recognizing this imperative, the Conference Board of Associated Research Councils * established the National Board on Graduate Education in 1971 to provide a means for an unbiased, thorough analysis of graduate education today and of its relation to American society in the future.

The National Board on Graduate Education is an autonomous body of twenty-six persons from the public and private sectors, chosen for their knowledge and interest in graduate education. Members were selected by the Conference Board to serve as individuals rather than as representatives of constituencies. The Board's role is active, investigative, and issue-oriented, with activities designed to provide a solid base of information and conceptual analysis to support its conclusions and recommendations. During its life, the Board will focus primarily upon doctoral level education in the humanities; social, biological and natural sciences; and engineering. (Professional fields such as law, medicine, and business administration are not included in the Board's activities.) Although major attention will be given to the doctoral degree, the Board's concern with graduate education will encompass advanced education from the Master's to the postdoctoral level, as well as new degrees, such as the Doctor of Arts.

In carrying out the Board's charge to focus upon the problems and issues surrounding graduate education and the Board's recommendations regarding them, the following staff activities have been defined:

(1) initiation of new research studies and the encouragement of experimentation and innovation;

* Composed of the American Council on Education, the Social Science Research Council, the American Council of Learned Societies, and the National Research Council.

(2) coordination and review of current research efforts and studies;

(3) dissemination of information and referrals for individuals, institutions, and agencies;

(4) preparation and circulation of a continuing annotated bibliography of literature on graduate education; and

(5) conduct of programs for the stimulation of public and professional discussion of the reports, findings, and recommendations of the Board.

As the initial statement of the Board, the present report sets forth the Board's view of the fundamental purposes of graduate education, discusses the problems and concerns currently facing graduate education, and indicates the role the Board will perform in helping to resolve these issues.

David D. Henry, Chairman
National Board on Graduate Education

November 1972

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PREFACE

Graduate Education: Purposes, Problems and Potential has been written to establish a framework for the discussion of several serious problems and issues facing graduate education today, and to suggest directions for research that will contribute to the formation of intelligent public policy toward graduate education. The report comments briefly upon the following topics: the projected labor market for Ph.D.'s; the rising costs and the financing of graduate education; geographic and qualitative dispersion of graduate schools and of students among these schools; graduate program effectiveness and relevance; the relationship of graduate to undergraduate education; access and recruitment for minority group members and women; and imitation and conformity in graduate education. In addition, future opportunities and directions, such as alternative models of graduate education, new graduate degrees, and graduate programs in black institutions, are briefly discussed.

The National Board on Graduate Education will contribute to public discussion of these problems and issues through an active program of sponsored research, conferences, commissioned reports, and published recommendations. Although the Board will not be able to support investigation of all these concerns from its own resources, it will serve as a catalyst for the work of other researchers. By taking cognizance of the research activity of others and by sponsoring projects that complement rather than duplicate such efforts, the Board will provide a sound body of information on which to base its final policy recommendations.

We hope that the present report will be of value to those concerned with the future of graduate education, and we encourage interested parties to communicate with the Board through the office of the Staff Director.

David W. Breneman, Staff Director

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November 1972

INTRODUCTION

The need for a National Board on Graduate Education was first articulated at the Conference on Predoctoral Education in the United States, held at the Summer Study Center of the National Academy of Sciences, Woods Hole, Massachusetts, in August 1969. Reflecting the changing circumstances of graduate education, a resolution adopted by participants in that conference stated in part that:

> Although graduate education in this country is strong, it can be made stronger and more responsive to national needs. We believe that the demands upon graduate education today cannot be met by simple extension of the trends and practices of the past decade. There is urgent need for serious reconsideration of the mechanisms and form of graduate education in many disciplines. The intensive research experience characteristic of programs which lead to the degree of Doctor of Philosophy is superb preparation for those pursuing careers in basic research. It is increasingly clear, however, that society also needs, and graduate students are seeking, alternative forms of graduate education. New graduate programs must be devised in response to the changing body of knowledge and to our need for persons educated to cope with urgent, newly emerging problems. These matters deserve the concentrated attention of graduate schools, employers, and governmental and private organizations concerned with graduate education.

A brief glance at the recent history of graduate education suggests that many of these concerns are a result of the rapid expansion of this sector of higher education in the years since World War II, a growth rate that could not be sustained indefinitely.[1] Much of this growth stemmed from the realization that the nation's scientific and technological preeminence required a vast reservoir of highly educated manpower which, in turn, was essential to

[1] For interesting interpretations of this recent history see Gustave O. Arlt, "Purifying the Pierian Spring," pp. 267-276; Harvey Brooks, "Thoughts on Graduate Education," pp. 319-336; and Howard R. Bowen, "Stresses and Strains," pp. 339-349, *The Graduate Journal* (University of Texas), VIII, No. 2, 1971.

our economic growth and development. Graduate schools and research activities in universities responded superbly to meet society's demands in the postwar period.

Another factor that explained the rapid growth of graduate education in the 1950's and 1960's was demographic, for the children born in the postwar "baby boom" were coming of age and enrolling in colleges in unprecedented numbers.[2] The increased need for qualified college and university professors and the desire of more students for advanced education imposed a tremendous demand upon the resources and capacity of the nation's graduate schools.

Infusions of state, federal, and foundation funds were provided on a massive scale to help the graduate schools expand to meet these demands. Not only were existing graduate schools enlarged, but numerous new graduate programs were begun, as undergraduate institutions acquired Master's and doctoral degree granting status.[3] The rapidity of expansion is indicated by the tripling of annual Ph.D. degrees awarded during the period 1960-1970, the number rising from 9,829 in 1960 to 29,872 in 1970.[4]

Since a growth rate of this magnitude could not be sustained, the system of graduate education is currently experiencing the difficult process of adjustment to reduced growth rates in a less supportive environment. The policies developed to support graduate education during the period of rapid growth, however, were marked by the absence of coordinated long-range planning, just as current policies to reduce support similarly are marked by an absence of concern for long-range effects. **The National Board on Graduate Education believes that the numerous decentralized decisions currently being made to reduce support of graduate education may have the unintended effect of severely damaging the nation's capacity to provide the quality and diversity of graduate education that we believe to be a continuing national need. While agreeing with the necessity for some limitation and selective retrenchment,**

[2] In 1950 there were 467,999 first-time students enrolled in institutions of higher education; by 1960 there were 923,069 first-time students, an increase of 98% over 1950. In 1970 the enrollment of first-time students had climbed to 1,775,158, a further increase of 92% during the decade. U.S. Office of Education, *Digest of Educational Statistics, 1971 Edition* (Washington, D.C.: U.S. Government Printing Office, 1972), p. 69.

[3] During the year 1959-60, 597 institutions awarded the Master's degree and 187 institutions granted the doctoral degree. By 1969-70 these figures had grown to 824 and 286 respectively. For data sources see U.S. Office of Education, *Earned Degrees Conferred, 1959-60, Bachelor's and Higher Degrees* (Washington, D.C.: U.S. Government Printing Office, 1962), p. 20, and U.S. Office of Education, *Earned Degrees Conferred: 1969-70 Institutional Data* (Washington, D.C.: U.S. Government Printing Office, 1970), pp. 5-26.

[4] See U.S. Office of Education, *Earned Degrees Conferred, 1959-60, Bachelor's and Higher Degrees* (Washington, D.C.: U.S. Government Printing Office, 1962), p. 35, and U.S. Office of Education, *Earned Degrees Conferred: 1969-70 Institutional Data* (Washington, D.C.: U.S. Government Printing Office, 1970), p. 5.

the Board is concerned by the absence of thoughtful planning and development of long-range policy designed to ensure continuing strength as the graduate schools adjust to a new environment. Wise policy formation on this complex subject requires the presence of a comprehensive body of fact and analysis, and much of the necessary information is currently lacking. Therefore, the Board hopes that through its program of studies and recommendations it can contribute positively and effectively to the formulation of sound policies toward graduate education.

As a first step toward this goal, this report sets forth the Board's view of the purposes and social role of graduate education and the problems, issues, and opportunities currently confronting this sector of higher education. The Board's approach to several of these concerns is discussed, highlighting the areas where further study is needed. As the initial statement of the Board, this report contains both expressions of belief and a discussion of the issues in need of exploration. This charter document will guide the activities of the Board and, hopefully, assist others equally concerned with the future of graduate education.

THE PURPOSES AND SOCIAL ROLE OF GRADUATE EDUCATION

During much of the recent discussion and uncertainty surrounding graduate education, there has been a tendency for the fundamental purposes and social role of graduate education to become obscured. In part, this condition is a natural response to a period of transition and adjustment, for as institutions evolve, their functions and roles also experience subtle alterations. **However, graduate education does perform certain essential functions not performed by other institutions, and these functions will endure in present or modified form through and beyond the current period of dislocation.** In the spirit of the dictum that "men require more often to be reminded than to be informed," the following statement of the Board regarding the purposes and social role of graduate education is intended to provide a helpful background for consideration of the problems and issues currently confronting graduate education.

The Education and Development of Skilled Individuals

A central purpose of the nation's graduate programs is to provide individuals with advanced education in a variety of forms and disciplines that is essential to the pursuit of specific careers. Historically, the education of specialists has been the dominant form of graduate education, providing individual students with a thorough education in a discipline and culminating, in doctoral programs, in an independent research investigation that advances the student to the frontier of knowledge in that discipline.

Individuals with such education have traditionally pursued one of several well-defined career patterns.[5] Many have followed research careers within universities, industry, government, or various non-profit institutions. Others have combined research with teaching in colleges and universities. Still others have chosen to devote themselves primarily to undergraduate teaching. And many have found careers in administration within universities, the various levels of government, industry and private foundations.

In addition to educating students, graduate schools also certify and grade the attainments of students, in common with all levels of education. By identifying talented people through this sorting and selecting process and helping them to realize their potential, graduate education contributes significantly to this important social role of the educational system.

Providing advanced education each year to thousands of students from abroad is another important facet of the social role of graduate education. Many of these foreign students return to their home countries and assume positions of leadership in government, universities, and industry, using their skills to aid the development of their nations. By contributing to this process, graduate education plays an important, if indirect, role in international cooperation and development.

Although the preceding discussion has related the educational purpose of graduate education to careers, it is important to emphasize that a vital function of graduate education is to allow individuals simply to pursue knowledge and inquiry in response to curiosity and desire to learn, an intrinsic value quite apart from occupational value. We should not lose sight of this purpose through an excessive concern with the supply and demand for skilled manpower.

The Production of Knowledge

In addition to the education of skilled individuals, a second broad purpose of graduate education is the production of new knowledge through research.

[5] For information on career patterns of doctoral degree holders, see National Academy of Sciences, *Doctorate Recipients from United States Universities, 1958-1966* (Washington, D.C.: National Academy of Sciences, 1967).

The process of producing a new Ph.D. simultaneously yields an addition to knowledge, for the Ph.D. degree is awarded only after an individual has completed a major research study. The research experience gained in the process of earning the doctorate is a vital first step in the subsequent careers of productive research scholars. In addition, the prospective teacher-scholar gains an understanding and appreciation of the process by which new knowledge is generated, which may enhance the individual's subsequent teaching effectiveness.

Apart from the doctoral student's own contribution to knowledge and the research experience imparted, the ongoing process of graduate education also contributes to faculty research as an additional outcome. Graduate education designed to develop a student's research skills could not flourish in a setting devoid of faculty research, and, in many disciplines, the presence of graduate students serving as research assistants is essential to the production of faculty research. Therefore, at the doctoral level, the education of students and the extension of knowledge through research are truly joint outcomes, each benefiting from the presence of the other.[6]

In addition to research activity within the disciplines, the modern university is increasingly called upon to apply its intellectual resources to the solution of pressing social and technological problems. Seeking the university's expertise, federal, state and private agencies have sponsored major mission-oriented research projects involving faculty and graduate students. In responding to outside requests for research on specific problems, the university has acquired a significant social role in the practical life of our society.[7]

The Preservation and Transmission of Knowledge

Although related to the educational purpose of graduate education discussed earlier, special notice must be given to a third fundamental purpose of graduate education—the preservation and transmission of knowledge. As the dominant institution responsible for the education of future college and university teachers, the graduate school is central to the social process by which our culture is preserved and transmitted to successive generations.

[6] Although this description is broadly accurate, the strength of the connection between graduate education and faculty research does vary among the disciplines, the link being strongest in the natural sciences, weakest in the humanities. A discussion of these departmental differences and the implications for length of time to degree and attrition rates for doctoral students is contained in David W. Breneman, *An Economic Theory of Ph.D. Production: The Case at Berkeley*, Ford Foundation Program for Research in University Administration, Paper P-8 (Berkeley: University of California, June 1970).

[7] This topic is discussed at length in Clark Kerr, *Uses of the University* (New York: Harper and Row, 1963).

Although increasing numbers of students may seek graduate education as preparation for other than teaching careers, the vital role of graduate school as the teacher of teachers will continue to be of central importance.

The Quality of Life in Our Society

In addition to the more specific purposes of graduate education discussed above, a central, although indirect, purpose of graduate education relates to the quality of life in our society. A society committed to increased understanding of nature, history, society, art and the humanistic tradition is qualitatively different from a society lacking that commitment. Modern civilization has not only differed from other civilizations in its technology and political forms, but also in its devotion to the advancement of science and the cultivation of a humanistic knowledge. The graduate school is today the most vital center of research, learning, and intellectual inquiry. This institution, created in its present form in the United States, has been paramount in transforming this country into the leading scientific center of the world. Its essential nature is sustained and its value is safeguarded by its freedom to question, to extend, to modify, to dissent from, or to discard existing ideas, norms, beliefs, and values on the basis of demonstrable evidence. Therefore, changes in the scope or function of graduate education should reflect the graduate school's central role in maintaining and advancing a scientific and humanistic culture which is not only a means to an end, but is an end in itself.

CURRENT PROBLEMS AND ISSUES CONFRONTING GRADUATE EDUCATION

The National Board on Graduate Education was established, in part, in response to a series of problems that threaten to diminish the capability of graduate education to fulfill its purposes. These problems can usefully be separated into two categories, reflecting differences in level of analysis and, hence, differences in the relevant decision-making groups to address these issues.

The first category encompasses problems most appropriately examined at the level of the total system of graduate education, although decisions made at this level clearly affect individual institutions. Problems in this category include the labor market for highly trained manpower, with particular empha-

sis on trends of supply and demand for Ph.D.'s; the rising costs and the financing of graduate education; and the issue of geographic and qualitative dispersion of graduate schools and of students among these schools. Each of these topics forces the analysis to go beyond the individual institution to the total system of graduate education, while each institution sees the local effects of these problems as changes in an external environment over which it exercises little control. In the absence of enlightened policy at the system level, the decentralized responses of individual institutions to these systemwide problems may appear perfectly rational to each institution, but collectively may result in an irrational outcome. (For example, each academic department may argue that its contribution to total Ph.D. supply is too small to matter, but summed over all departments, such arguments may produce excess capacity.) In addressing certain issues at this level, the Board hopes to contribute to a better understanding of the systemwide implications of various policy decisions.

The second category of problems involves issues properly studied at the level of the individual institution. Decisions regarding these problems are appropriately made within the institution, for the problems are internal to the graduate school, although often influenced by external factors. In this category are included such problems as program effectiveness and relevance; the relationship of graduate to undergraduate education; equal opportunity in the admission of students and recruitment of staff; internal resource allocation; and imitation and conformity in graduate education. The Board plans to address several of these issues in a fashion designed to help decisionmakers at the institutional level, although recognizing that unique factors at each university must necessarily condition decisions at that level.

Systemwide problems of concern to the Board include the following:

The Labor Market for Ph.D.'s

Newspaper headlines have spread the word throughout the country that the conditions of heavy excess demand for Ph.D.'s that marked the late 1950's and much of the 1960's have changed substantially in the last two to three years, as the demand for Ph.D.'s has softened. Although unemployment rates of Ph.D.'s are well below national averages,[8] the serious problems of under-

[8] "In the spring of 1971, only an estimated 1.4 percent of all science Ph.D.'s were unemployed, while the national unemployment rate was about 6 percent. Of all persons who received the Ph.D. in 1970 an estimated 1.6 percent were unemployed or not seeking work and another 1.2 percent were in positions where their skills were not utilized." U.S. Department of Labor, *1972 Manpower Report of the President* (Washington, D.C.: U.S. Government Printing Office, 1972), p. 115.

employment and disappointed career expectations are growing. Moreover, the value of advanced education in many disciplines declines rapidly if the individual is unable to pursue active work in that field. In addition to these difficulties being experienced by some new Ph.D.'s entering the labor market and by a somewhat larger number of older doctorate holders, the longer run problems of Ph.D. supply and demand have been set forth in a series of projections that conclude that the market for Ph.D.'s over the next decade is not favorable.[9]

Manpower projections can contribute significantly to the formulation of wise public policy, provided policy makers are aware of the limitations that surround the various projection techniques. The Board believes, however, that some policy decisions are currently being made without an awareness of these limitations and thus wishes to sound three cautionary notes.

First, the science of forecasting manpower requirements is still in a primitive stage of development. An examination of the history of past forecasts indicates that unforeseen changes in the economic and social environment have rapidly rendered most forecasts obsolete. Economist Mark Blaug, a leading expert in this field, observed in a recent survey of the techniques of manpower forecasting that:

> At present, forecasts of manpower requirements cannot be made with any reliability beyond periods of three to four years—and even three-year forecasts have frequently proved inaccurate—and yet the time perspective of almost all manpower forecasts is as long as ten to fifteen years.[10]

Second, several factors point to the danger of possible overreaction to the currently depressed market for Ph.D.'s. The Board is concerned that some policy-makers at the federal and state levels are ignoring or are unaware of the important distinction between manpower **projections** and **predictions.** As Allan Cartter has written, ". . . one should draw a careful distinction between projections and predictions; the former may illustrate the consequences of

[9] See F. E. Balderston and Roy Radner, *Academic Demand for New Ph.D.'s, 1970-90: Its Sensitivity to Alternative Policies,* Ford Foundation Program for Research in University Administration, Paper P-26 (Berkeley: University of California, December 1971); Dael Wolfle and Charles V. Kidd, "The Future Market for Ph.D.'s," *Science, 173* (August 27, 1971), pp. 784-793; National Science Foundation, *1968 and 1980 Science and Engineering Doctorate Supply and Utilization,* NSF 71-20 (Washington, D.C.: U.S. Government Printing Office, May 1971); Allan M. Cartter, "Scientific Manpower for 1970-1985," *Science, 172* (April 9, 1971), pp. 132-140; Laurence B. DeWitt and A. Dale Tussing, *The Supply and Demand for Graduates of Higher Education: 1970 to 1980,* EPRC Research Report RR-8 (Syracuse: Syracuse University Research Corporation, December 1971).

[10] Mark Blaug, *An Introduction to the Economics of Education* (London: Allen Lane the Penguin Press, 1970), p. 167.

current trends and thus serve to alter the course of events." [11] There is considerable evidence that students and graduate institutions are reacting to the recent projections, suggesting that the future supply of Ph.D.'s will be considerably less than projected.[12] We must guard against the pendulum swinging too far in certain fields.

A second factor that may contribute to possible overreaction is the fact that Ph.D. production is a multiple-year process, and the effects of current policies will not be totally clear for several years. The cyclical instability of such a lagged, phased-response system has been well documented in the work of Richard Freeman[13]; labor markets for many types of highly-educated manpower have historically oscillated between over- and under-supply. Decisionmaking that ignores this feature of the labor market will almost certainly tend toward error.

The Board's third cautionary note is that although most of the aggregate projections for Ph.D.'s agree that the labor market forecast for the next decade is not favorable, this tells us very little about the field-by-field supply and demand for doctorates. Thus, current policies may lead to future shortages in certain fields accompanied by excesses in other fields.

Given these cautionary comments on the general limitations of manpower forecasting, however, the Board does believe that the specific forecasts of diminished future *academic* demand for Ph.D.'s, based largely on demographic considerations, are broadly accurate.[14] This suggests that an increasing percentage of new Ph.D.'s will be employed in the nonacademic sectors of the economy, and, for this reason, expansion of traditional doctoral programs oriented toward the academic market does not seem warranted at this time.

To increase understanding of the issues that surround manpower projections, the Board has begun a critical review of the various projection techniques, pointing to the areas that need additional study. Further, the Board is exploring research possibilities designed to disaggregate the analysis of supply and demand for highly educated personnel on a field-by-field basis. With the availability of more refined data and analysis, it may be possible

[11] Allan M. Cartter, "The Academic Labor Market," unpublished mimeograph, 1972.

[12] Relevant studies are Lincoln E. Moses, "The Response of Graduate Enrollment to Placement Opportunities," *Science, 177* (August 11, 1972), pp. 494-497; National Science Foundation, "First-Year, Full-Time Graduate Science Enrollment Continues to Decline," *Science Resources Studies Highlights,* NSF 72-308 (Washington, D.C.: U.S. Government Printing Office, May 25, 1972); and "Doctoral Education in Chemistry: Facing the 1970's," *Chemical and Engineering News* (August 14, 1972), pp. 35-39.

[13] Richard B. Freeman, *The Market for College-Trained Manpower* (Cambridge: Harvard University Press, 1971).

[14] For projections of academic demand see F. E. Balderston and Roy Radner, *op. cit.,* and Allan M. Cartter, "Scientific Manpower for 1970-1985," *Science, 172* (April 9, 1971), pp. 132-140.

to anticipate changing labor market conditions and speak with greater confidence regarding the efficacy and wisdom of alternative courses of action.

The Rising Costs and the Financing of Graduate Education

The rapidly rising cost of all levels of higher education has become a matter of intense national concern and has rendered the debate regarding the proper way to finance this cost all the more acute and pressing. As the reputedly most expensive sector of higher education, apart from medical education, questions of cost and financing are of particular concern to graduate education.

The question, "Who should pay the cost of graduate education?" is related to the labor market problem, since it was the shortage of Ph.D.'s during the 1950's and 1960's that provided a major justification for massive federal fellowship and traineeship support for graduate students. This support has been dramatically reduced in the last four years, with the total number of federally supported graduate students declining from 51,446 during fiscal year 1969 to 22,121 estimated for fiscal 1972.[15] Furthermore, only an estimated 2,673 new federal awards were funded during fiscal 1972.[16] The present policy trend toward reduced federal fellowship support seems to be based on two propositions: (1) the current excess supply of Ph.D.'s sharply reduces the need for continuing federal subsidy and (2) a belief that the benefits of graduate education are captured exclusively by the individual, implying that the individual and not society should bear the full cost of attaining that education.

A variety of complex issues surrounds both of these propositions. Turning first to the question of costs, the Board is concerned by simplistic references to "full cost pricing" since these imply that we know how to determine full costs accurately at the graduate level. The conceptual difficulties involved have been carefully outlined in the recently completed GRADCOST STUDY sponsored by the Council of Graduate Schools and the National Association of College and University Business Officers.[17] This study warned against applying naive measurements to the costs of graduate education, because the process of graduate education involves the joint products, research and

[15] Federal Interagency Committee on Education, Student Study Group, *Report on Federal Predoctoral Student Support, Part I* (Washington, D.C.: April 1970), Table 9; and preliminary data from Federal Interagency Committee on Education, "Predoctoral Fellowships and Traineeships," revised February 1972.

[16] Preliminary data from Federal Interagency Committee on Education, "Predoctoral Fellowships and Traineeships," revised February 1972.

[17] John H. Powel, Jr. and Robert D. Lamson, *Elements Related to the Determination of Costs and Benefits of Graduate Education* (Washington, D.C.: The Council of Graduate Schools, 1972); and Joseph L. McCarthy and David R. Deener, *The Costs and Benefits of Graduate Education: A Commentary with Recommendations* (Washington, D.C.: The Council of Graduate Schools, 1972).

education, discussed earlier in this paper. Cost determination is further complicated by the fact that graduate students, themselves an input to the graduate education process, frequently serve as instructors of undergraduates within the same institution, thereby lowering the costs of undergraduate education. However, despite these conceptual problems that render cost analysis difficult, the fact remains that graduate education traditionally has been heavily subsidized and that principle is currently being challenged.

In general, the questions of financing the cost of graduate education revolve around who should pay (students? parents? state government? federal government? business?) and what form financial aid should take (student loans? teaching assistantships? research assistantships? fellowships? traineeships? institutionally awarded or awarded to the student?). In the past a variety of these forms of support has been used to support students in graduate education. **A coherent, long-range policy toward student support, based on sound conceptual analysis and empirical evidence was (and is) lacking.** A sound policy must include the following **efficiency** considerations:

(1) evidence regarding the presence or absence of social benefits of graduate education not captured by the individual student;
(2) the effect on student choice of the pricing policies placed on graduate education by the university;
(3) the implications for finance of the mobility of human beings, for the human capital created by investment in graduate education may not remain within the state that supports the training.

In addition to efficiency considerations, a sound policy of student support must also reflect the following **equity** considerations:

(1) access to graduate education by the underprivileged, minority groups, and women;
(2) the regional distribution of graduate schools, with the implied impact on the regional economy and access by regional residents.

Furthermore, the issue of institutional support must be considered, for the process of graduate education requires that the university provide teachers, laboratories, libraries, computers, specialized journals, space, and research equipment, all of which must be financed from some source.

A number of issues surrounding the financing of graduate education are in need of careful analysis and research. The Board supports proposed studies discussed at the recent conference of the Board on Human Resources [18]

[18] Conference at Woods Hole, Massachusetts on "The Benefits of Higher Education," sponsored by the National Research Council, Board on Human Resources, and Panel on the Benefits of Higher Education, July 16-19, 1972.

to investigate the presence (or absence) of social benefits associated with higher education as a basis for policy determination. Careful analysis of the mobility of Ph.D.'s, focused upon the implications for state versus federal financing, and study of the differential effects of the various forms of student aid are also needed. The Board gives these issues high priority and is in the process of preparing a report that sets forth the conceptual issues, empirical evidence on current trends, and suggestions for further research.

The Geographic and Qualitative Dispersion of Graduate Education

During the past decade a major national commitment was made to the creation and support of multiple "centers of excellence" in graduate education. President Johnson's Executive Order of September 13, 1965,[19] asserted that every region of the country should be served by excellent graduate schools. This federal thrust matched the interests of most faculty members, university administrators, and many state legislators, and thus the growth and increased support of new or expanded doctoral programs were set in motion. Recent developments now point to a series of related policy problems springing from this source:

(1) the labor market problems for Ph.D.'s, referred to above, raise questions of overcapacity;

(2) recent reductions in federal and private support for graduate education appear to have had a relatively greater adverse impact on the "prestigious" graduate institutions, causing many of these schools to reduce new graduate enrollments with subsequent redistribution of graduate students to the less developed schools [20]; these developments suggest the need to investigate whether the average quality of graduate education is being affected adversely;

(3) concern and confusion regarding the appropriate way to proceed exist in many quarters, exemplified by the recent New York Regents' one-year moratorium on all new graduate programs in the state of New York.

These concerns raise the basic question of how many graduate programs the nation needs in the long run, and what governmental policy should be toward geographic distribution of graduate schools and allied resources.

The National Board on G[illegible]duate Education believes that geographic distribution is a fundamental problem facing graduate education that requires

[19] U.S. Congress, Senate, Committee on Government Operations, *Equitable Distribution of R&D Funds by Government Agencies, Hearings,* before the Subcommittee on Government Research, Senate, on S. Res. 110, Ninetieth Congress, First Session, 1967.

[20] Charles V. Kidd, "Shifts in Doctorate Output by Types of Universities in the '60's and Projected for the '70's," *Proceedings of the 14th Annual Meeting,* Western Association of Graduate Schools (Tempe: March 1972), pp. 38-58.

careful study and, ultimately, a policy recommendation. The research issues that relate to this question include the regional impact of a graduate university, the quality of graduate education, the quality of **undergraduate** education, the careful estimation of the nation's long-run need for educated manpower, questions of "critical mass" in graduate education, and careful study of the particular needs served by the different institutions.

Problems at the institutional level of concern to the Board include the following:

Program Effectiveness and Relevance

This broad topic encompasses a variety of specific issues, but the overriding question involves the degree to which legitimate demands on graduate education are currently being met. We need to know to what extent the mix of programs provided by graduate departments is determined by conditions such as excessive faculty concern for "academic prestige" which may render the programs unresponsive to social demand. Conversely, we must also determine whether some of the demands addressed to graduate schools are inappropriate or unjustified. Exploration of this central question should illuminate the following specific problems:

(1) The undergraduate curriculum in many colleges and universities is currently undergoing major change—open enrollments, elimination of general education courses as well as traditional majors and specific course requirements, "experiential education," field study, independent study, and various forms of affective learning. When students with this background enroll in traditional graduate programs, a significant fraction find the programs to be rigid, overly specialized, and not relevant to their needs. The pressures being created by this mismatch of student interests and the nature of graduate education call for sensitive study to guide the process of adjustment necessary for both graduate school and student.

(2) Some business and industrial employers have expressed a dissatisfaction with what they perceive to be the narrowness and inflexibility of many new doctoral recipients. Similarly, many Ph.D.'s have found nonacademic employment to be limiting and parochial. Since nonacademic employment of doctoral degree-holders is likely to increase, the articulation between curricular content and employment opportunities must be explored.

(3) Two-year community colleges are an expanding sector of higher education and might be expected to absorb growing numbers of Ph.D.'s in faculty positions. There is evidence, however, that many community colleges are reluctant to employ traditionally educated Ph.D.'s because of an alleged mismatch between the teaching-oriented nature of the job requirements and

the research orientation and aspiration of most Ph.D.'s.[21] It is important to study the nature of this perceived mismatch to determine whether (and how) graduate programs should be restructured to meet the needs of the two-year college.

The Relationship of Graduate to Undergraduate Education

Continuing debate and controversy surround the nature of the relationship of undergraduate to graduate education within the university. Some assert that the relationship is mutually beneficial because faculty quality and productivity are enhanced by the presence of graduate students, with these benefits also accruing to undergraduates. Economically, the relationship is deemed beneficial to the total university since graduate students serve as teaching assistants, thereby lowering the cost of undergraduate instruction, while providing a means for graduate student financial support.

However, critics have challenged this view by asserting that graduate programs often gain a stranglehold over the undergraduate programs, in both educational and economic terms.[22] Professors are said to devote their time primarily to graduate students, ignoring the undergraduates, with resources shifted internally from undergraduate to graduate programs. Although this debate is by no means new, a reappraisal of this relationship is warranted.

Problems of Access and Recruitment for Minority Members and Women

The overwhelming majority of faculty members in the United States are white males.[23] It is unlikely that this accurately reflects the distribution of talents required for teaching and research in the population. Conditions must be created to assure access to graduate education for minority mem-

[21] For discussion of opportunities for employment of Ph.D.'s in community colleges see John W. Huther, "Small Market for Ph.D.'s: The Public Two-Year College," *AAUP Bulletin, 58*, No. 1 (Spring, 1972), pp. 17-20; and Lucian S. Pugliaresi, "Inquiries into a New Degree: The Candidate in Philosophy," Ford Foundation Program for Research in University Administration, Paper P-13 (Berkeley: University of California, 1970).

[22] See Earl James McGrath, *The Graduate School and the Decline of Liberal Education* (New York: Columbia University, 1959), for a strong statement of this position.

[23] In the fall of 1967 there were 264,001 male and 66,564 female full-time instruction and research staff members in institutions of higher education. U.S. Office of Education, *Numbers and Characteristics of Employees in Institutions of Higher Education, Fall 1967*, by Richard Beazley (Washington, D.C.: U.S. Government Printing Office, 1967), p. 14. Moreover, data based upon a sample survey by The Carnegie Commission on the Future of Higher Education and the American Council on Education estimated that 96.6% of male faculty were white. U.S. Office of Education, *Digest of Educational Statistics, 1971 Edition* (Washington, D.C.: U.S. Government Printing Office, 1972), p. 81.

bers and for women. In addition to access, these individuals must have the financial resources and the type of graduate environment that provide them with a reasonable opportunity to complete the degree program. Those who join college and university faculties must be assured equal opportunity for professional advancement.

Imitation and Conformity in Graduate Education

Although there is ample reason to question the need for additional doctoral programs of the traditional variety, faculty members in many colleges and universities continue to press for such programs. Some of the incentives for faculty to be associated with doctoral education are evident, e.g., status, prestige, professional advancement. However, more subtle factors may be involved. We need to understand in a more sophisticated fashion than we currently do, the forces that motivate institutions not offering graduate work to seek to establish doctoral programs. This tendency toward conformity and imitation vitiates the overall strength of higher education which is derived, in part, from its very diversity.

THE POTENTIAL OF GRADUATE EDUCATION

If graduate education is to maintain its vitality and creativity, it must do more than simply respond to external demands and problem situations of the type discussed above. It must also take the initiative in assessing its own performance and seek new opportunities for service. While many of the basic functions of graduate education remain viable today as historically evolved, new ones will be added. All of them, old and new, are subject to changing activities and programs as the times require. The Board intends to support this process of self-renewal in graduate education by initiating and encouraging vigorous discussion of a number of issues, ideas, and questions including:

Alternative Models of Graduate Education

Growing numbers of "nontraditional" students are seeking new forms of graduate education, designed to meet unique needs and interests. Women

who have raised families and wish to update their occupational skills, minority members seeking programs oriented toward specific community problems, older people interested in career transition—these and other groups are expressing a need for "nontraditional" graduate programs. Increasingly, in a variety of business, governmental, and other settings, individuals who wish to advance their capacities for service to the fullest potential seek the opportunity for part-time doctoral education at universities in the metropolitan communities where they are employed. While many of these needs are currently being met, much more can be done. The Board welcomes the formation of the Panel on Alternative Approaches to Graduate Education, sponsored by the Council of Graduate Schools and the Graduate Record Examination Board, and will assist the Panel whenever possible in its study of nontraditional programs for nontraditional students.

New Graduate Degrees

The need for a new degree designed specifically for prospective undergraduate teachers has been long discussed, and several universities are currently implementing Doctor of Arts or Master of Philosophy programs to meet this perceived need.[24] Since most of these programs are of recent origin, little evidence is yet available on the acceptance and long-run prospects of the degree. The Board hopes to encourage thoughtful analysis of the role of the new degree and its relation to traditional doctoral programs.

Interdisciplinary Graduate Programs

The growing demands for integration and application of knowledge from several disciplines toward the solution of specific technological and societal problems are a major factor explaining the increased interest in interdisciplinary graduate programs. Another is the growing realization that relevant techniques and perspectives from other disciplines may be fruitfully applied to research problems within a discipline. However, not enough is known about the current status and potential of such programs. Many questions concerning the types of curricula, field and research experience, faculty training, and program organization most appropriate for interdisciplinary programs remain to be explored.

[24] A thorough discussion of these new programs is contained in Paul L. Dressel and Frances H. DeLisle, *Blueprint for Change: Doctoral Programs for College Teachers* (Iowa City, Iowa: The American College Testing Program, 1972), Monograph Eight.

Review of the Master's Degree

The rapid growth in the number of Master's degrees awarded (74,497 awarded in 1959-60, increasing to 209,387 in 1969-70),[25] and the sheer magnitude of these numbers, suggest a need and an opportunity to review the status of this degree. Little is known, however, about the motivation of individuals who seek the degree, although much of the impetus may stem from teachers wishing to upgrade their academic credentials. Because of this teacher certification function and the relative ease with which Master's programs can be established, a lack of standardization in curriculum and program requirements is alleged to exist, raising questions about the quality of many programs. These and other issues need to be explored in the context of a thorough analysis of the role of the Master's degree.

Graduate Programs in Black Institutions

The role of graduate education in primarily black institutions is a topic of considerable interest in need of further study and discussion. The various types of graduate programs currently being offered in black institutions should be examined, with an assessment made of existing program resources and future potential for graduate education. The types of graduate programs in these institutions that might be expected to receive public and private support should be explored.

Comment

If the potential of graduate education is to be fulfilled, a continuing discussion of these and other issues, such as the role of the research institute, trends in postdoctoral programs, the regional impact of a graduate university, and changing student attitudes toward graduate education, is essential. The Board intends to encourage this vital dialogue by sponsoring conferences, by encouraging program and curricular experimentation, and by commissioning essays and reports.

[25] U.S. Office of Education, *Earned Degrees Conferred, 1959-1960, Bachelor's and Higher Degrees* (Washington, D.C.: U.S. Government Printing Office, 1962), p. 13; and U.S. Office of Education, *Earned Degrees Conferred; 1969-70, Summary Data* (Washington, D.C.: U.S. Government Printing Office, 1972), p. 7.

CONCLUSION

The Board believes that the purposes of graduate education discussed earlier in this report will continue to be of major and enduring importance to the nation's future. The capability of graduate education to fulfill those purposes, however, will depend critically upon the degree of wisdom that is brought to bear on the important decisions that must be made during the current period of adjustment and reassessment. If hasty and unwise decisions are made, irreparable damage may be done to the system of graduate education, permanently diminishing the nation's capability to provide high-quality education and research. The effects of such diminished capability would soon be manifest throughout society in a variety of tangible and intangible ways. Thus, all of the country's citizens have reason to be concerned about the future strength and vitality of this sector of higher education.

As has been suggested, the precise nature of enlightened policy for many of the problems mentioned is far from clear. The Board intends, through its program of studies and through the support of work by others, to assist in the formulation of intelligent long-run policy toward graduate education. **While this necessary process of investigation is being undertaken, we urge decisionmakers to recognize the fragile nature of the system, and caution against the type of hasty, and perhaps irreversible, decisions that may unnecessarily foreclose valuable options.** We believe that the current period of examination, if conducted in a supportive atmosphere, will result in a strengthened system of graduate education more responsive to the future needs of the nation.